IN THE CLAIMS:

1. (currently amended) A magnetic resonance imaging system comprising:

a patient bore;

a gradient coil assembly surrounding said patient bore; ~~and~~

an RF body coil assembly coupled between said patient bore and said gradient coil assembly, said RF body coil assembly comprising at least one hollow conductor structure fluidically coupled to a coolant source having a non-conductive coolant, said non-conductive coolant flowing through said at least one hollow conductor structure to maintain said patient bore below a maximum desired temperature during operation of the magnetic resonance imaging system;

a copper stub pipe fluidically coupled to each of said plurality of hollow conductor structures; and

a non-conducting manifold fluidically coupled between said copper stub pipe and said coolant source.

2. (currently amended) The magnetic resonance imaging system of claim 1, wherein said ~~water-cooled~~ RF body coil assembly comprises:

a plurality of RF antennae spaced circumferentially around said patient bore;

a composite material;

a plurality of hollow conductor structures contained within said composite material, one of said plurality of hollow conductor structures coupled to a respective one of said plurality of RF antennae; and

a coolant source fluidically coupled with each of said plurality of hollow conductor structures, said coolant source capable of providing ~~water~~ a non-conductive coolant through each of said plurality of hollow conductor structures.

3. (original) The magnetic resonance imaging system of claim 1, wherein one of said plurality of hollow conductor structures comprises a hollow copper structure.

4. (original) The magnetic resonanc imaging system of claim 2 further comprising a glass cloth introduced within said composite material.

5. (cancelled).

6. (original) The magnetic resonance imaging system of claim 1, wherein said maximum desired temperature is about 24 degrees Celsius.

7. (original) The magnetic resonance imaging system of claim 2, wherein said coolant source comprises a water source.

8. (original) The magnetic resonance imaging system of claim 7, wherein said non-conductive coolant comprises deionized water.

9. (currently amended) The magnetic resonance imaging system of claim 1, wherein said ~~water-cooled~~ RF body coil assembly comprises:

a composite material;

a plurality of hollow radiofrequency coils contained within said composite material; and

a coolant source fluidically coupled with each of said plurality of hollow radiofrequency coils, said coolant source capable of providing coolant through each of said plurality of hollow radiofrequency coils.

10. (currently amended) The magnetic resonance imaging system of claim ~~9~~ 35, wherein one of said plurality of hollow radiofrequency coils comprises a hollow copper radiofrequency coil.

11. (currently amended) The magnetic resonance imaging system of claim ~~9~~ 35 further comprising a glass cloth introduced within said composite material.

12. (currently amended) The magnetic resonance imaging system of claim ~~9~~ 35 further comprising:

a copper stub pipe fluidically coupled to each of said plurality of hollow radiofrequency coils; and

a non-conducting manifold fluidically coupled between said copper stub pipe and said coolant source.

13. (currently amended) The magnetic resonance imaging system of claim ~~9~~ 35, wherein said coolant source comprises a water source.

14. (original) The magnetic resonance imaging system of claim 13, wherein said non-conductive coolant comprises deionized water.

15. (original) The magnetic resonance imaging system of claim 2, wherein said composite material is formed from the reaction of a bisphenol A-type epoxy resin with an anhydride hardener.

16. (currently amended)The magnetic resonance imaging system of claim ~~9~~ 35, wherein said composite material is formed from the reaction of a bisphenol A-type epoxy resin with an anhydride hardener.

17. (withdrawn) A method for forming a coolant-cooled RF body coil assembly for use in a magnetic resonance imaging machine, the method comprising:

providing a pair of mandrels;

introducing a plurality of RF coils within a cavity regions between said pair of mandrels, each of said plurality of RF coils being coupled to a hollow conductor structure;

introducing a quantity of uncured composite material under vacuum pressure to said cavity;

curing said uncured composite material; and

removing said mandrels.

18. (withdrawn) The method of claim 17, further comprising introducing a glass cloth within said cavity prior to introducing said quantity of uncured composite material to said cavity.

19. (withdrawn) The method of claim 18, wherein introducing a quantity of uncured composite material and curing said uncured composite material comprises:

slowly introducing a first quantity of a bisphenol A type epoxy and a second quantity of an anhydride hardener under vacuum pressure to said cavity;

reacting said first quantity with said second quantity within said cavity to form a cured composite material.

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20. (withdrawn) A method for forming a coolant-cooled RF body coil assembly for use in a magnetic resonance imaging machine, the method comprising:

providing a pair of mandrels;

introducing a plurality of hollow RF coils within a cavity regions between said pair of mandrels;

introducing a quantity of uncured composite material under vacuum pressure to said cavity;

curing said uncured composite material; and

removing said mandrels.

21. (withdrawn) The method of claim 20, further comprising introducing a glass cloth within said cavity prior to introducing said quantity of uncured composite material to said cavity.

22. (withdrawn) The method of claim 20, wherein introducing a quantity of uncured composite material and curing said uncured composite material comprises:

slowly introducing a first quantity of a bisphenol A type epoxy and a second quantity of an anhydride hardener under vacuum pressure to said cavity;

reacting said first quantity with said second quantity to form a cured composite material.

23. (currently amended) A method for forming magnetic resonance imaging machine having a temperature-controlled patient bore, the method comprising:

~~forming a coolant-cooled RF body coil assembly;~~

providing a pair of mandrels;

introducing a plurality of RF coils within a cavity regions between said pair of mandrels, each of said plurality of RF coils being coupled to a hollow conductor structure;

introducing a quantity of uncured composite material under vacuum pressure to said cavity;

curing said uncured composite material;

removing said mandrels to form a coolant-cooled body coil assembly;

introducing said coolant-cooled RF body coil assembly within the magnetic resonance imaging machine between a gradient coil assembly and the patient bore;

fluidically coupling said coolant-cooled RF body coil to a coolant source; and

introducing a quantity of coolant from said coolant source through said coolant-cooled RF body coil during a scanning procedure, said quantity of coolant therein maintaining the temperature within the patient bore below a desired maximum temperature.

24. (original) The method of claim 23, wherein said desired maximum temperature is below about 24 degrees Celsius.

25. (original) The method of claim 24, wherein said quantity of coolant comprises a quantity of water.

26. (cancelled).

27. (currently amended) The method of claim ~~26~~ 23, further comprising introducing a glass cloth within said cavity prior to introducing said quantity f uncured composite material to said cavity.

28. (currently amended) The method of claim ~~26~~ 23, wherein introducing a quantity of uncured composite material and curing said uncured composite material comprises:

slowly introducing a first quantity of a bisphenol A type epoxy and a second quantity of an anhydride hardener under vacuum pressure to said cavity;

reacting said first quantity with said second quantity to form a cured composite material.

29. (cancelled).

30. (currently amended) The method of claim ~~29~~ 41, further comprising introducing a glass cloth within said cavity prior to introducing said quantity of uncured composite material to said cavity.

31. (currently amended) The method of claim ~~29~~ 41, wherein introducing a quantity of uncured composite material and curing said uncured composite material comprises:

slowly introducing a first quantity of a bisphenol A type epoxy and a second quantity of an anhydride hardener under vacuum pressure to said cavity;

reacting said first quantity with said second quantity to form a cured composite material.

32. (new) A magnetic resonance imaging system comprising:

a patient bore;

a gradient coil assembly surrounding said patient bore;

an RF body coil assembly coupled between said patient bore and said gradient coil assembly, said RF body coil assembly comprising:

a plurality of RF antennae spaced circumferentially around said patient bore;

a composite material;

a glass cloth introduced within said composite material;

a plurality of hollow conductor structures contained within said composite material, one of said plurality of hollow conductor structures coupled to a respective one of said plurality of RF antennae; and

a coolant source fluidically coupled with each of said plurality of hollow conductor structures, said coolant source capable of providing a non-conductive coolant through each of said plurality of hollow conductor structures to maintain said patient bore below a maximum desired temperature during operation of the magnetic resonance imaging system.

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33. (new) The magnetic resonance imaging system of claim 32, wherein one of said plurality of hollow conductor structures comprises a hollow copper structure.

34. (new) The magnetic resonance imaging system of claim 32 further comprising:

a copper stub pipe fluidically coupled to each of said plurality of hollow conductor structures; and

a non-conducting manifold fluidically coupled between said copper stub pipe and said coolant source.

35. (new) A magnetic resonance imaging system comprising:

a patient bore;

a gradient coil assembly surrounding said patient bore;

an RF body coil assembly coupled between said patient bore and said gradient coil assembly, said RF body coil assembly comprising:

a composite material;

a plurality of hollow radiofrequency coils contained within said composite material; and

a coolant source fluidically coupled with each of said plurality of hollow radiofrequency coils, said coolant source capable of providing coolant through each of said plurality of hollow radiofrequency coils to maintain said patient bore below a maximum desired temperature during operation of the magnetic resonance imaging machine.

36. (new) The magnetic resonance imaging system of claim 35, wherein one of said plurality of hollow conductor structures comprises a hollow copper structure.

37. (new) The magnetic resonance imaging system of claim 35 further comprising:

a copper stub pipe fluidically coupled to each of said plurality of hollow conductor structures; and

a non-conducting manifold fluidically coupled between said copper stub pipe and said coolant source.

38. (new) The magnetic resonance imaging system of claim 35, wherein one of said plurality of hollow radiofrequency coils comprises a hollow copper radiofrequency coil.

39. (new) The magnetic resonance imaging system of claim 35 further comprising a glass cloth introduced within said composite material.

40. (new) The magnetic resonance imaging system of claim 35, wherein said composite material is formed from the reaction of a bisphenol A-type epoxy resin with an anhydride hardener.

41. (new) A method for forming magnetic resonance imaging machine having a temperature-controlled patient bore, the method comprising:

providing a pair of mandrels;

introducing a plurality of hollow RF coils within a cavity regions between said pair of mandrels;

introducing a quantity of uncured composite material under vacuum pressure to said cavity;

curing said uncured composite material; and

r moving said mandrels to form a coolant-cooled RF body coil assembly;

introducing said coolant-cooled RF b dy coil assembly within th magnetic resonance imaging machine between a gradient coil assembly and the patient bore;

fluidically coupling said coolant-cooled RF body coil to a coolant source; and

introducing a quantity of coolant from said coolant source through said coolant-cooled RF body coil during a scanning procedure, said quantity of coolant therein maintaining the temperature within the patient bore below a desired maximum temperature.